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A.D. 1854 . . . . . N<sup>o</sup> 1758.

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S P E C I F I C A T I O N

OF

WALTER BLUNDELL.

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APPARATUS FOR APPLYING FREEZING  
MIXTURES TO PARTS OF THE HUMAN  
BODY PREPARATORY TO SURGICAL  
OPERATIONS.

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L O N D O N :

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,  
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*Prior 6d.*

1855.







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A.D. 1854 . . . . . N° 1758.

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**Apparatus for Applying Freezing Mixtures to Parts  
of the Human Body Preparatory to Surgical  
Operations.**

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**LETTERS PATENT** to Walter Blundell, of No. 29, New Broad Street, in the City of London, Surgeon Dentist, for the Invention of “**AN IMPROVED APPARATUS FOR TREATING OR PREPARING ANY PART OF THE HUMAN BODY REQUIRING TO BE SURGICALLY OPERATED UPON, FOR THE PURPOSE OF TOTALLY OR PARTIALLY BENUMBING THE SENSE OF FEELING AT THE DESIRED PART OF THE HUMAN BODY.**”

Sealed the 8th December 1854, and dated the 11th August 1854.

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**PROVISIONAL SPECIFICATION** left by the said Walter Blundell at the Office of the Commissioners of Patents, with his Petition, on the 11th August 1854.

I, WALTER BLUNDELL, of No. 29, New Broad Street, in the City of London,  
5 Surgeon Dentist, do hereby declare the nature of the said Invention for “**AN IMPROVED APPARATUS FOR TREATING OR PREPARING ANY PART OF THE HUMAN BODY REQUIRING TO BE SURGICALLY OPERATED UPON, FOR THE PURPOSE OF TOTALLY OR PARTIALLY BENUMBING THE SENSE OF FEELING AT THE DESIRED PART OF THE HUMAN BODY,**” to be as follows :—

10 This Invention consists in the use and employment of an apparatus constructed upon the principle of an ordinary refrigerator, and the principal features of novelty in this Invention consist in causing the liquid of any



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known freezing mixture to flow or circulate through a bladder attached to the apparatus, said bladder being employed in the manner and for the purpose herein-after stated. It would be well here to observe that I am aware of a mode having heretofore been employed for benumbing the sense of feeling at any desired part of the human body, for the purpose of facilitating surgical 5 operations and rendering them less objectionable than heretofore, and such benumbing operation has been partially effected by the application of a cold fluid to the part to be benumbed, for the purpose of absorbing the heat from such part. The objection to this mode of operating is, that as soon as the temperature of the cooling fluid becomes raised to that of the part to which it 10 is applied, it ceases to produce any further effect until a fresh quantity of cooling fluid is applied, and therefore only partially benumbs the part, and does not, therefore, effect the desired object. And I obviate this objection and render perfect the benumbing operation by so arranging and constructing the part which contains the cooling fluid, as that the said fluid is kept con- 15 tinually circulating through the same, and therefore has the effect of carrying off the heat from the part to which it is applied as fast it is absorbed by the fluid, and thereby produces the desired benumbing effect most perfectly. The nature of this Invention will, however, be more fully ascertained by the following description of the apparatus which I employ for effecting the above- 20 mentioned purposes.

DESCRIPTION OF THE APPARATUS.

I construct a vessel of gutta percha or other light waterproof material, into which I place salt and ice, or other known freezing mixture, the ice resting upon a perforated or inner false bottom, placed at a convenient distance from 25 the lower part or outer bottom of the said vessel, thus forming a chamber, into which the freezing mixture passes as it becomes liquified, and there is a cock affixed to the bottom of the aforesaid vessel for regulating the discharge of the liquid contents thereof, which pass through a piece of vulcanized india-rubber tubing, one end of which is securely fixed to the aforesaid cock, and the other 30 and opposite end of said tube is securely fixed to a small silver pipe; one end of this pipe is soldered to a circular flat piece of silver, the under side whereof has a screw or thread formed thereon, upon which fits a silver ring, and to this ring a piece of bladder (by preference the bladder from a rabbit) is securely fastened and made water-tight in any convenient manner. In some cases, 35 however, I propose employing a piece of metal instead of the above-mentioned bladder, and upon the upper side of the before-mentioned circular piece of



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silver there is soldered one end of another short silver pipe, similar in all respects to that before mentioned, and to this last-mentioned pipe one end of a piece of vulcanized india-rubber tubing of smaller diameter than that before mentioned is affixed, and to the other and opposite end of said tubing a small  
5 silver cock is securely affixed, said cock being employed for discharging into any convenient receptacle the liquid from the vessel containing the freezing mixture. The mode of using this apparatus is as follows:—Supposing it, for example, to be used by a dentist, the operator opens the large cock and fills the bag with the freezing liquid; he then applies the bag to the tooth to be  
10 extracted, and pressing it against the gum at such part, holds it there, and opening the small cock slightly, allows the freezing fluid to flow or circulate through the bag, and thus carry off the heat from the particular part of the gum to which it is applied as fast as it is absorbed by the liquid, and it is this peculiar mode of absorbing the heat continuously which effects the perfect  
15 benumbing of the part to which it is applied, and thus constitutes this Invention. It is to be understood that the coldness of the fluid in the bag will depend in a great measure upon the velocity with which it passes through the bag, which may be easily regulated by the operator pressing the tube between his thumb and fingers. The shape and size of the bag will also depend upon  
20 the purpose for which it is required, and must be constructed accordingly.

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**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed by the said Walter Blundell in the Great Seal Patent Office on the 10th February 1855.

**TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WALTER**  
25 **BLUNDELL**, of No. 29, New Broad Street, in the City of London, Surgeon, Dentist, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Eleventh day of August, in the year of our Lord One thousand eight hundred and fifty-four, in the eighteenth year of Her reign,  
30 did, for Herself, Her heirs and successors, give and grant unto me, the said Walter Blundell, Her special licence that I, the said Walter Blundell, my executors, administrators, and assigns, or such others as I, the said Walter Blundell, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the  
35 term therein expressed, should and lawfully might make, use, exercise, and



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vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for “**AN IMPROVED METHOD OF TREATING OR PREPARING ANY PART OF THE HUMAN BODY REQUIRING TO BE SURGICALLY OPERATED UPON, FOR THE PURPOSE OF TOTALLY OR PARTIALLY BENUMBING THE SENSE OF FEELING AT THE DESIRED PART OF THE HUMAN BODY,**” upon the condition 5 (amongst others) that I, the said Walter Blundell, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent. 10

**NOW KNOW YE**, that I, the said Walter Blundell, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof (that is to say):—

My Invention consists in the use and employment of an apparatus constructed upon the principle of an ordinary refrigerator, and the principal features of novelty of my said Invention consist in causing a liquid, cooled by ice, or any known freezing mixture, to flow or circulate through a piece of metal, bladder, oil'd silk, membrane, or other material of suitable character, attached to the apparatus, said piece of metal or bladder or other material being employed 20 in the manner and for the purpose herein-after stated. It would be well here to observe that I am aware of a mode having heretofore been employed for benumbing the sense of feeling at any desired part of the human body, for the purpose of facilitating surgical operations and rendering them less objectionable than heretofore, and such benumbing operation has been partially effected by 25 the application of a cold fluid to the part to be benumbed, for the purpose of absorbing the heat from such part. The objection to this mode of operating is, that as soon as the temperature of the cooling fluid becomes raised to that of the part to which it is applied, it ceases to produce any further effect until a fresh quantity of cooling fluid is applied, and therefore only partially benumbs 30 the part, and does not, therefore, so perfectly effect the desired object. And I obviate this objection and render perfect the benumbing operation by so arranging and constructing the part which contains the cooling fluid, as that the said fluid is kept continually circulating through the same, and therefore has the effect of carrying off the heat from the part to which it is applied as 35 fast as it is absorbed by the fluid, and thereby produces the desired benumbing effect most perfectly.

In order to explain my said Invention as completely as possible, I now



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proceed to describe the best means I am acquainted with for carrying the same into practical effect, reference being had to the illustrative Drawing hereunto annexed, and to the numeral figures and letters of reference marked thereon respectively, as follows :—

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## DESCRIPTION OF THE DRAWING.

Figure 1 is a side elevation, partly in section, of an apparatus constructed according to my said Invention, shewing the general arrangement and disposition of the parts when ready for use. Figures 2 and 3 are detached parts of the apparatus drawn to an enlarged scale. At each of the foregoing Figures  
10 I employ similar letters of reference to denote corresponding parts, in so far as such parts appear or can be seen at each of the said Figures respectively. At Figure 1, A is a metal vessel or refrigerator, constructed with an inner case B and false bottom C; the space between the inner and outer case I fill with charcoal, wool, or other substance which is a good non-conductor of heat, and at the  
15 centre of the false bottom C, I form a hole and insert and connect a short piece of tube *a* therein, and upon the said tube I place and connect a perforated tube of metal D, so that when the salt and ice or other freezing mixture is placed within the vessel A, the liquid portion thereof only shall pass into the space which is below the false bottom C, from whence it passes by a cock E  
20 into and through a piece of elastic tubing F, one end of which is affixed to said cock, and to the other end of such said tubing I connect one or other of the pieces exhibited at Figures 2 and 3, that is to say; if the apparatus is required to be used in performing dental operations, I employ the piece exhibited at Figure 3, the construction of which is as follows :—I form a hollow  
25 piece of metal G into a kind of horse-shoe shape, so as to cover or press against the tooth and gum, and the parts G, I coat or cover with any substance which is a good non-conductor of heat. I also form apertures at opposite sides of the piece G, into which I insert and fix pieces of rigid tubing *i*, *k*, and to one of these pieces of tubing I connect the aforesaid long tube F, and thus I establish  
30 a communication between the piece G and the vessel A; and to the piece *k* I affix another piece of elastic tubing H, same being furnished at its opposite end with a cock I, for discharging (into any convenient receptacle, as at K,) the liquid as it passes from the vessel A through the piece G. I would remark that in order to effect a more perfect adaptation of the parts *g*, *g*, of the piece G  
35 to the inequalities of the tooth and gum, I propose to line such part either with gold, silver, or other suitable metallic foil, or a semi-fluid amalgam, and with the apparatus thus constructed I operate in the following manner :—



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## MODE OF OPERATING.

The operator first opens the cock E, so as to fill the piece G with the cooled liquid; he then applies the part *g* of the piece G to the tooth which is to be extracted, and pressing it upon the tooth holds it there, and then opens the cock I slightly, so as to allow the cooled liquid to flow gently through the 5 piece G (at the commencement of the benumbing operation), so as to absorb the heat gradually from the tooth and gum at such part, and continues opening the cock I at such intervals of time as he finds it desirable, so as to encrease the velocity at which the cooled liquid passes through the piece G, and consequently encreasing gradually the intensity of the cold at such part; thus it 10 will be seen that as the cooled liquid flows through the piece G, it will be continually absorbing the heat from the region of the tooth, the liquid passing off by the aforesaid cock I into any convenient receptacle; and it is this peculiar method of absorbing the heat continuously, as above stated, which effects the perfect benumbing of the part to which it is applied. It is to be 15 understood that the degree of coldness of the fluid in the piece G will depend in a great measure upon the velocity with which said fluid passes through the said piece, which may be easily regulated by the operator pressing the tube F between his thumb and fingers. And in applying my said Invention for the purpose of benumbing in the performance of surgical operations generally, I 20 employ in lieu of the piece G before mentioned, pieces of ivory, bone, or metal L, L, of the shape exhibited at Figure 2, or of other convenient form, to which I affix a piece of bladder M or other material (and I have found the bladder of a rabbit answer well), and I connect the pieces L, L, respectively to the tubes F and H, so that in using the same, the bladder M or other material, 25 when filled with cooled liquid, is applied to the part to be operated upon, the size of such said bladder or other material being proportioned to the part to which it is to be applied. It will, therefore, be found desirable in practice to have these parts of the apparatus formed of different sizes, and I also in some cases prefer employing this bladder or other material, instead of 30 the piece G for dental operations. And I would here remark that as in practice I have found the above mode of benumbing the sense of feeling calculated in many instances to produce an unpleasant sensation to the patient, arising from the comparatively sudden application of cold to the part which is to be operated upon, I propose, therefore, to remedy this by constructing the 35 apparatus upon the principle contained in a subsequent Provisional Specification of a Patent, applied for by me, the said Walter Blundell, on the



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Twenty-fifth day of November, One thousand eight hundred and fifty-four, and numbered 2,494.

Having now described the nature and object of my said Invention of an improved mode of treating and preparing any part of the human body  
5 requiring to be surgically operated upon, for the purpose of totally or partially benumbing the sense of feeling at the desired part of the human body, and in what manner the same is to be and may be performed, I would remark, in conclusion, that what I claim is, the use and employment of an apparatus constructed as above described, or any modified form thereof, so long as the  
10 same principle of construction is maintained, *i.e.*, the continuous flow of a liquid, cooled by ice or any known freezing mixture, into and through one or more pieces of metal G, or bladder M, or other material, shewn at Figures 2 and 3, so as to effect and maintain continuous absorption of heat from the part to which it is applied, for the purpose of benumbing the sense of feeling  
15 at such part, as above more particularly described and set forth.

In witness whereof, I, the said Walter Blundell, have hereunto set my hand and seal, this Ninth day of February, in the year of our Lord One thousand eight hundred and fifty-five.

WALTER BLUNDELL. (L.S.)

20 Witness,

J. RICHARD QUINTON,  
1, Pavilion Colonade,  
Brighton.

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LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty. 1855.







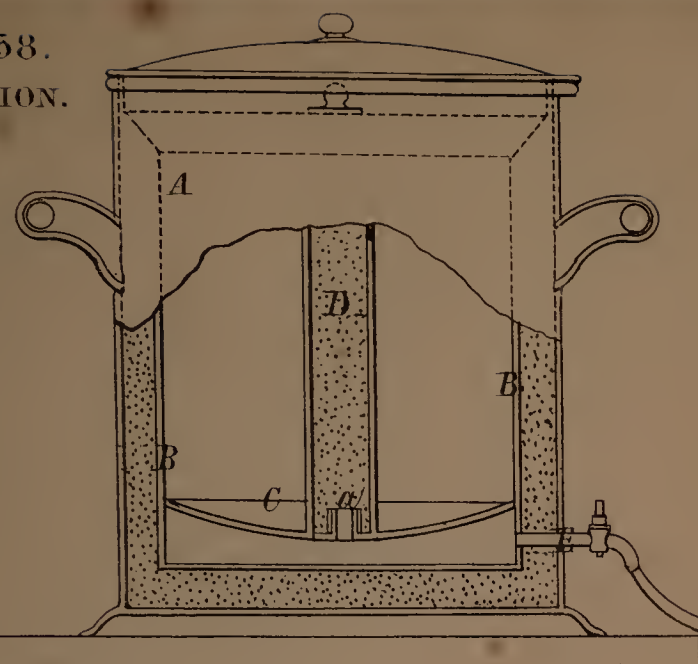


FIG. 2.

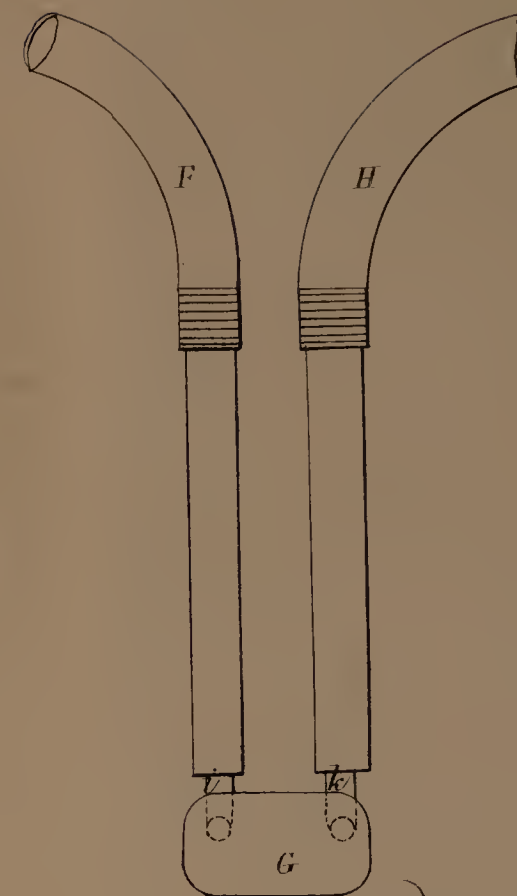
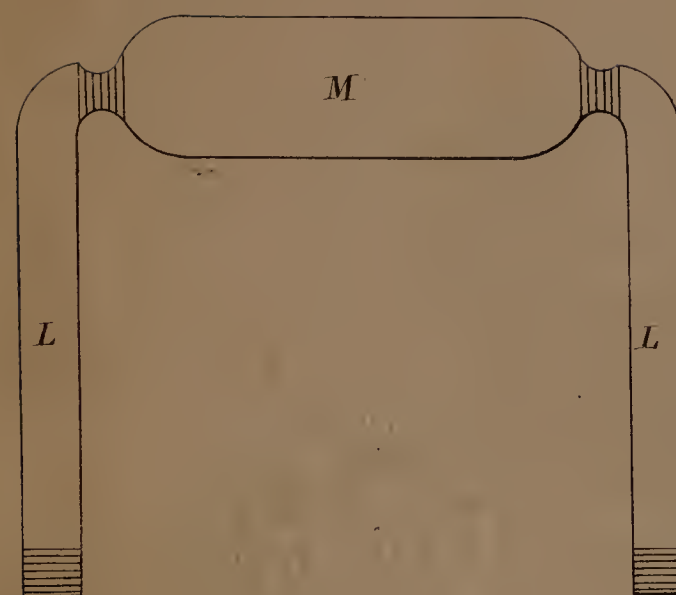
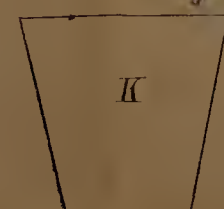
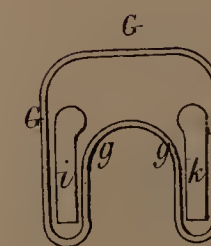


FIG. 3.



The colored drawing is not colored.



